

**Remarks**

Claims 87-151 are pending.

Claims 1-86 have been canceled and are pending in parent application USSN 10/132,834.

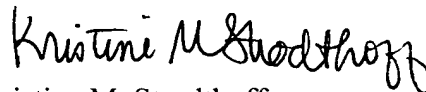
New Claims 122-151 have been added. Support for the new claims is in the original claims as filed, and in the specification for example, at page 7, lines 24-28 (support materials) and page 10, line 25 to page 11, line 14. No new matter is added with the addition of the new claims.

In the specification, a new paragraph has been added after the title at page 1 to include a cross-reference to related applications.

In addition, the specification at page 10, line 27, has been amended to clarify and to correct an obvious typographical error. (See, Appendix I.) No new matter is added with this amendment.

It is respectfully submitted that the claims are in condition for allowance and notification to that effect is earnestly solicited. The Examiner is urged to telephone the undersigned attorney if any questions should arise.

Respectfully submitted,



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## **APPENDIX I**

Replacement sheet for page 10 of the specification  
(and a blacklined version)

Referring to **FIGS. 7-8**, in yet another embodiment, the standoff(s) 16<sub>(2)</sub> can be fabricated to contain a heat sink 31<sub>(2)</sub>. The standoff(s) 16<sub>(2)</sub> can be formed, for example of a plastic material, as a dam or other enclosure. As depicted, the standoff 16<sub>(2)</sub> has been formed as a circular dam structure, although other shapes (e.g., triangular, oval, square, rectangular, and the like) can be utilized to form an enclosure. A thermally conductive material such as copper or aluminum, for example, can be deposited or applied to the upper surface 28<sub>(2)</sub> of the die 12a<sub>(2)</sub>, 12b<sub>(2)</sub> within the confines of the standoff(s) 16<sub>(2)</sub> to form a heat sink 31<sub>(2)</sub> for dissipating heat from the die 12a<sub>(2)</sub>, 12b<sub>(2)</sub> during operation.

In another embodiment, a heat sink material 31<sub>(3)</sub> can be disposed about the standoff(s) 16<sub>(3)</sub> on the surface 28<sub>(2)</sub> of the die 12a<sub>(3)</sub>/12b<sub>(3)</sub> as depicted in **FIGS. 7A-8A**. A thermally conductive material can be disposed on the surface of the die, for example, by masking and electroplating, by adhering a metal foil, among other methods.

The standoff(s) can be applied, for example, by a screen printing method, by stenciling, coating, masking, stamping, heat stamping, dispensing a flowable material using a liquid capillary, spray coating, direct spreading, affixing a pre-formed material using an adhesive (e.g., a cylindrical object, an adhesive-backed decal), electroplating, anodizing, or other method known and used in the art. The standoff(s) can be a prefabricated plastic, formed into a desired configuration, for example, by injection molding, extrusion, blow molding, compression molding, transfer molding, thermoforming, and among other methods. Useful adhesive materials for attaching the standoffs to the die surface are known in the art, and include contact adhesives, thermoplastic adhesives and thermosetting adhesives, for example, an adhesive gel or paste such as a conventional epoxy or polyimide die bonding adhesive, and/or a double-sided adhesive tape such as polyimide, and can be used to apply the standoff under pressure and/or heat.

In another example of a die construction and package illustrated in **FIGS. 9-12**, a semiconductor die 12a', 12b' can be mounted on the upper surface 32' of a support substrate 34' (e.g., polyimide tape, etc.) through having an opening 36' formed by stamping, for example, using a dielectric adhesive 38' (e.g., paste or double-sided tape), or conductive bumps as described for **FIGS. 3-5**. The semiconductor die 12a', 12b' includes bond pads 40' electrically connected by wire bonds 42' to bond pads 44' on the underside 46' of the support

Referring to **FIGS. 7-8**, in yet another embodiment, the standoff(s) 16<sub>(2)</sub> can be fabricated to contain a heat sink 31<sub>(2)</sub>. The standoff(s) 16<sub>(2)</sub> can be formed, for example of a plastic material, as a dam or other enclosure. As depicted, the standoff 16<sub>(2)</sub> has been formed as a circular dam structure, although other shapes (e.g., triangular, oval, square, rectangular, and the like) can be utilized to form an enclosure. A thermally conductive material such as copper or aluminum, for example, can be deposited or applied to the upper surface 28<sub>(2)</sub> of the die 12a<sub>(2)</sub>, 12b<sub>(2)</sub> within the confines of the standoff(s) 16<sub>(2)</sub> to form a heat sink 31<sub>(2)</sub> for dissipating heat from the die 12a<sub>(2)</sub>, 12b<sub>(2)</sub> during operation.

In another embodiment, a heat sink material 31<sub>(3)</sub> can be disposed about the standoff(s) 16<sub>(3)</sub> on the surface 28<sub>(2)</sub> of the die 12a<sub>(3)</sub>/12b<sub>(3)</sub> as depicted in **FIGS. 7A-8A**. A thermally conductive material can be disposed on the surface of the die, for example, by masking and electroplating, by adhering a metal foil, among other methods.

The standoff(s) can be applied, for example, by a screen printing method, by stenciling, coating, masking, stamping, heat stamping, dispensing a flowable material using a liquid capillary, spray coating, direct spreading, affixing a pre-formed material using an adhesive (e.g., a cylindrical object, an adhesive-backed decal), electroplating, anodizing, or other method known and used in the art. The standoff(s) can be a prefabricated plastic, formed into a desired configuration, for example, by injection molding, extrusion, blow molding, compression molding, transfer molding, thermoforming, and among other methods. Useful adhesive materials for attaching the standoffs to the die surface are known in the art, and include contact adhesives, thermoplastic adhesives and thermosetting adhesives, for example, an adhesive gel or paste such as a conventional epoxy or polyimide die bonding adhesive, and/or a double-sided adhesive tape such as polyimide, and can be used to apply the standoff under pressure and/or heat.

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